

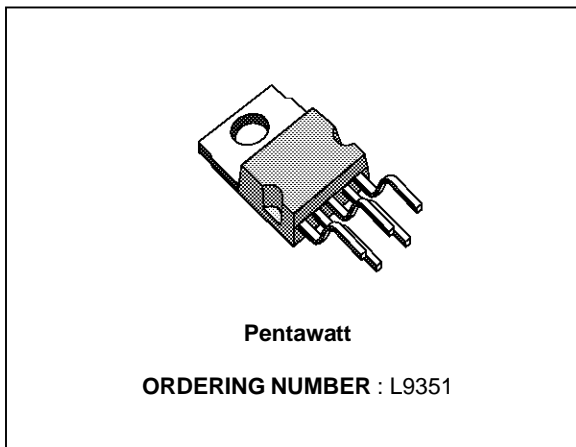
HIGH SIDE DRIVER

ADVANCE DATA

- LOW SATURATION VOLTAGE
- TTL COMPATIBLE INPUT
- WIDE SUPPLY VOLTAGE
- VERY LOW QUIESCENT CURRENT (30mA max)
- NO EXTERNAL COMPONENTS
- INTERNAL RECIRCULATION PATH FOR FAST DECAY OF INDUCTIVE LOAD CURRENT
- SHORT CIRCUIT PROTECTION
- FAILSAFE OPERATION : OUTPUT IS OFF IF THE LOGIC INPUT IS LEFT OPEN

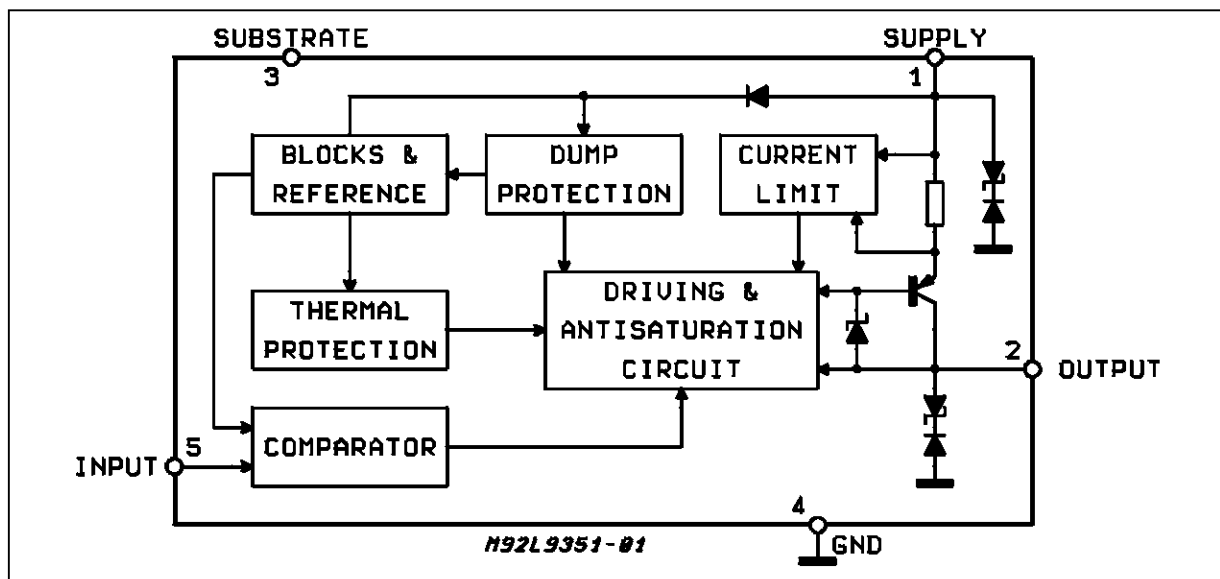
DESCRIPTION

The L9351 is a monolithic integrated circuit designed to drive grounded resistive, inductive or mixed loads from the power supply positive side. Very low standby current (30mA max.) and internally implemented protections against load dump and reverse voltages make the device very useful in automotive applications. No external components are required because the output recirculation clamping zener is included in the chip. This zener can withstand a recirculation peak current of 550mA on a 80mH/25 Ω load.



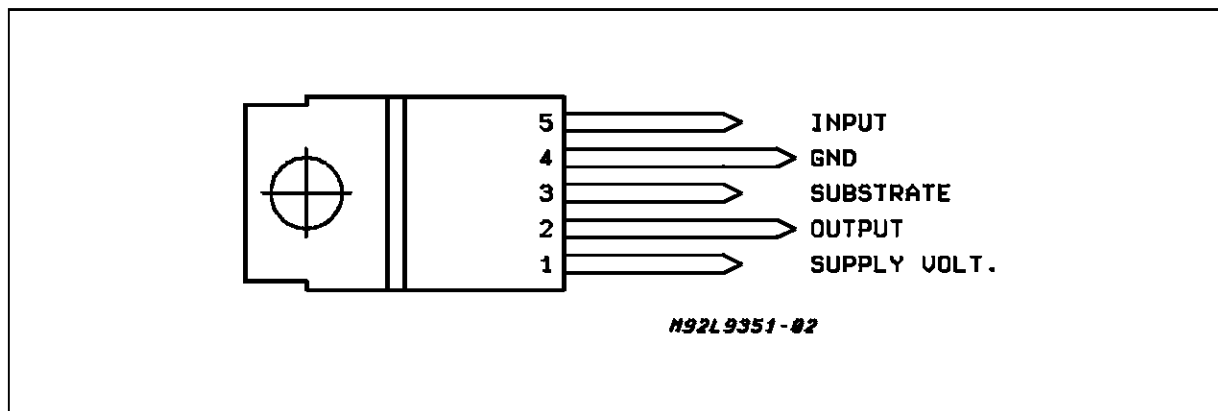
The device is self-protected against overtemperature, overvoltage and overcurrent conditions. The L9351 operates over the full battery voltage range, from 4.5V (cold cranking) up to 24V (jump starting). The L9351 withstands reverse battery conditions (-13V) and supply voltage transients up to 80V limiting the maximum output transistor V_{EC} to 70V by an internal zener. ON and OFF delaytimes of 25 μ s max in any output status, including recirculating situation, allow PWM use of L9351.

BLOCK DIAGRAM



L9351

PIN CONNECTION (top view)



Note : Pin 3 must be left open or connected to ground.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_s	D.C. Supply Voltage	24	V
	D.C. Reverse Supply Voltage	-13	V
	Load Dump: $5\text{ms} \leq t_{\text{rise}} \leq 10\text{ms}$ t_f Fall Time Constant = 100ms, $R_{\text{source}} \geq 0.5\Omega$	60	V
	Low Energy Spikes: $R_{\text{source}} \geq 10\Omega$, $t_{\text{rise}} = 1\mu\text{s}$, $t_f = 2\text{ms}$, f_r Repetition Frequency = 0.2Hz	± 85	V
V_i	Input Voltage	-0.3 to 7	V
I_o	Output Current	Internally Limited	
P_{tot}	Total Power Dissipation at $T_{\text{case}} = 90^\circ\text{C}$	17.1	W
T_j, T_{stg}	Junction and Storage Temperature	-55 to 150	$^\circ\text{C}$

THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{\text{th j-amb}}$	Thermal Resistance Junction-ambient	Max. 80	$^\circ\text{C}/\text{W}$
$R_{\text{th j-case}}$	Thermal Resistance Junction-case	Max. 3.5	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS

($V_S = 14.4V$, $-40^{\circ}C \leq T_j \leq +125^{\circ}C$ unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_S	Operating Supply Voltage		4.5		24	V
V_{IH}	Input Voltage High	$4.5 < V_S < 24$	2.0			V
V_{IL}	Input Voltage Low			1	0.8	V
I_I	Input Current	$0.8 < V_I < 5.5V$			40	μA
I_{PL}	Output Leakage Current	$V_O = 0V$ $V_S = 24V$ $V_I < 0.8V$			140	μA
V_{sat}	Output Saturation Voltage	$I_O = 125mA$ $V_S = 4.5V$			0.5	V
		$I_O = 225mA$ $V_S = 14.4V$			0.5	V
		$I_O = 550mA$ $V_S = 14.4V$			0.7	V
I_{SC}	Output Short Circuit Current		0.6	1.5		A
I_Q	Quiescent Current	$V_I > 2V$			30	mA
		$V_I < 0.8V$ Stand-by Condition		100	150	μA
V_{ZO}	Negative Output Zener Voltage	$R_L = 25\Omega$ $L = 80mH$ on V_I Transition from "1" to "0"	-36	-30	-24	V
T_{on}	Turn ON Delay	Resistive Load $R_L = 25\Omega$, $T_j = 25^{\circ}C$ (fig.2)			20	μs
T_{off}	Turn OFF Delay				25	μs

Figure 1 : Typical Automotive Application Circuit.

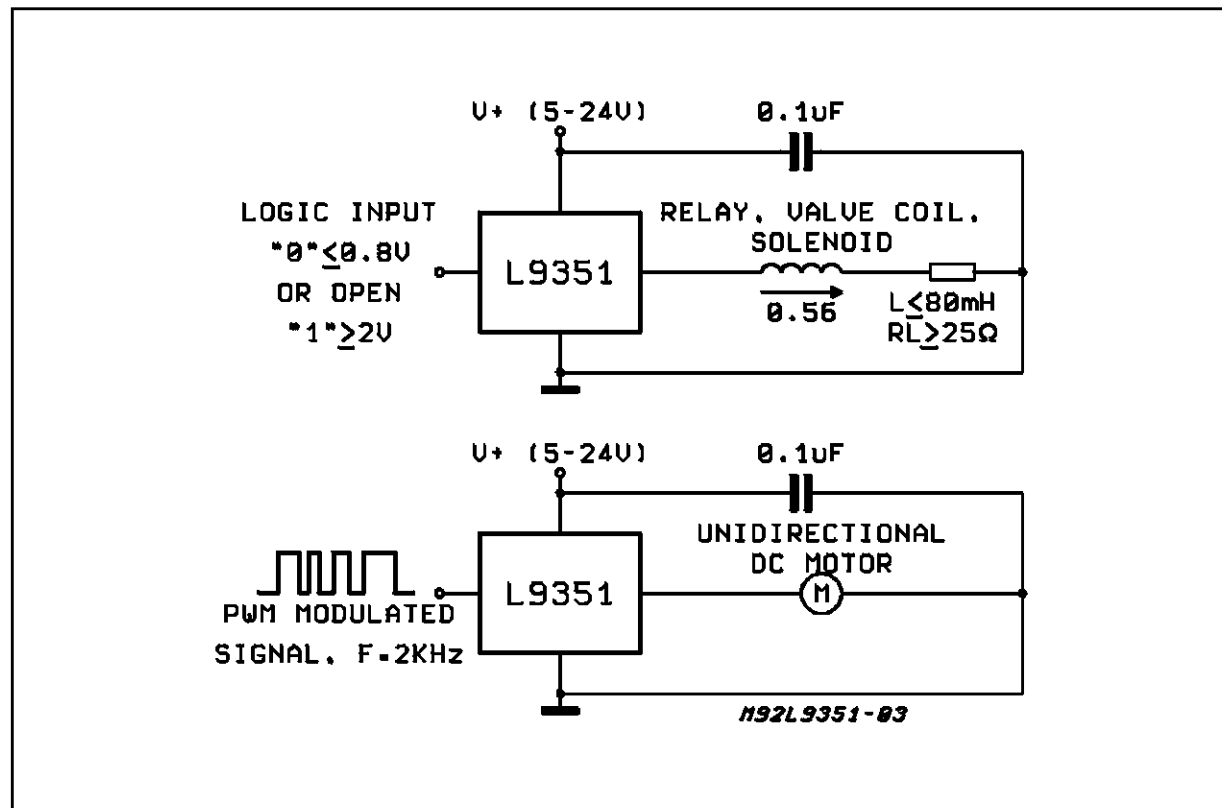


Figure 2 : Resistive Load.

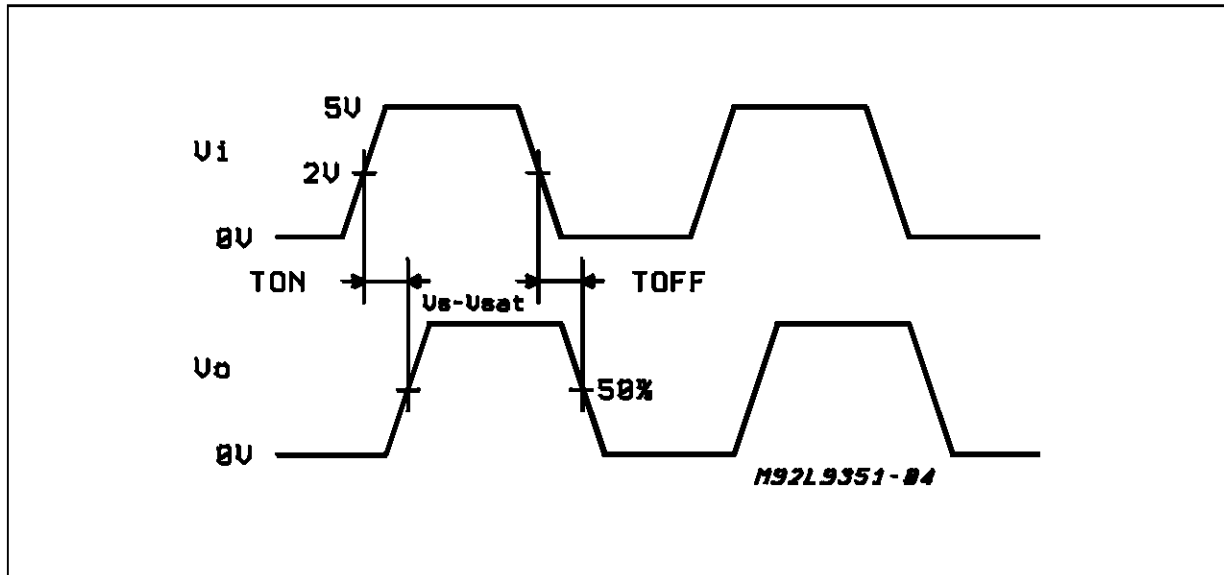
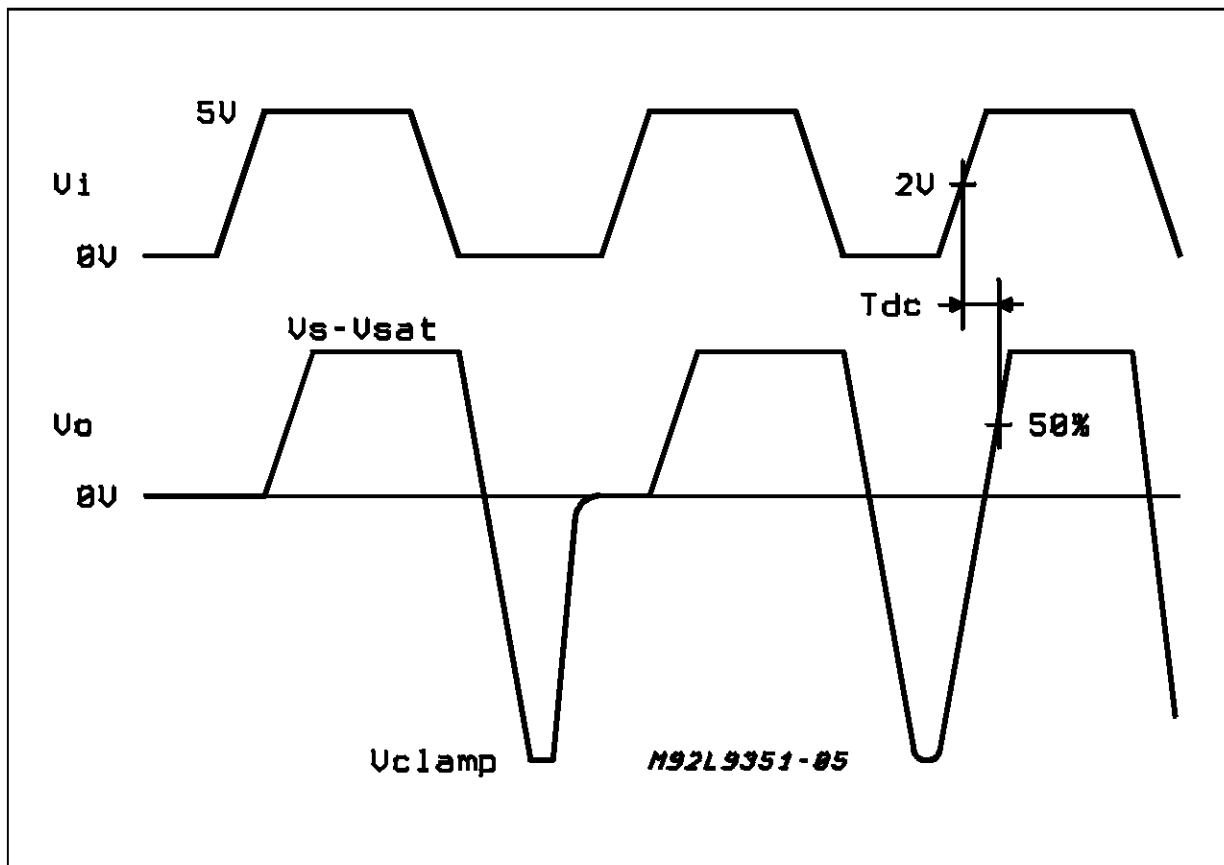
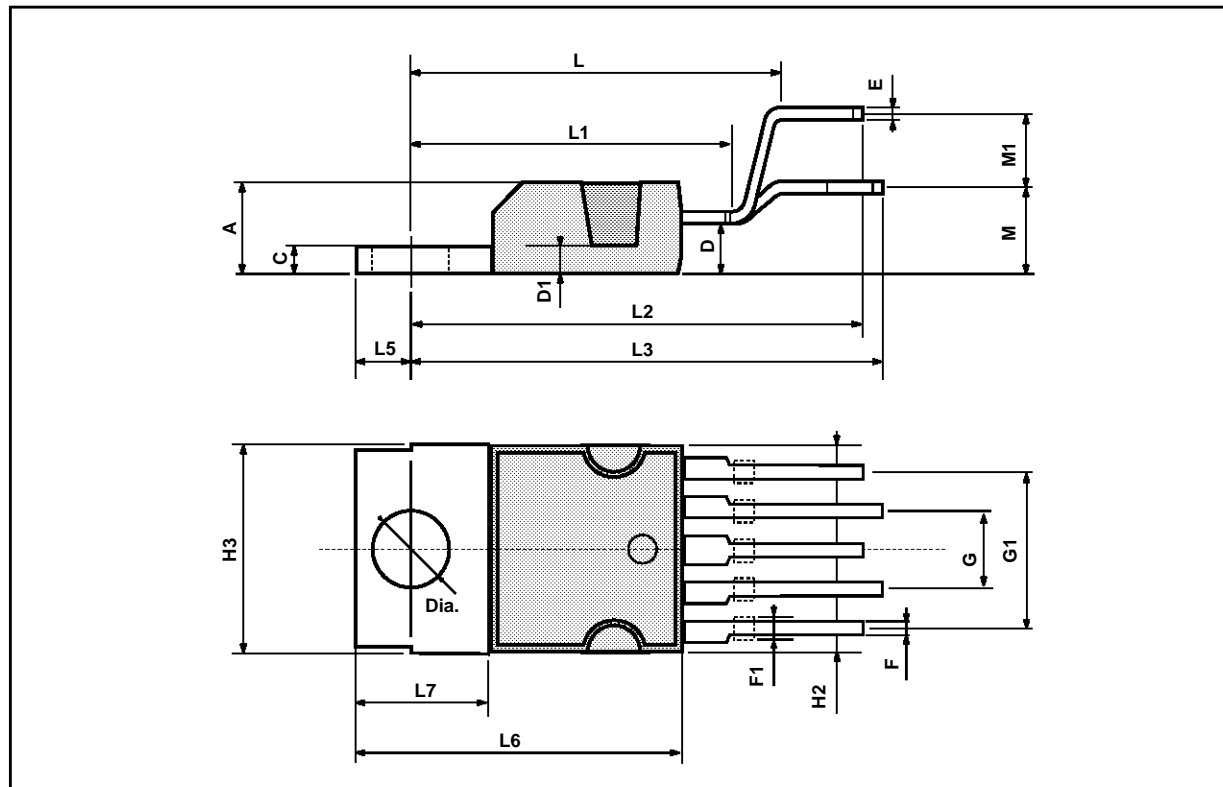


Figure 3 : Inductive Load.



PENTAWATT PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.8		1.05	0.031		0.041
F1	1		1.4	0.039		0.055
G		3.4		0.126	0.134	0.142
G1		6.8		0.260	0.268	0.276
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L		17.85			0.703	
L1		15.75			0.620	
L2		21.4			0.843	
L3		22.5			0.886	
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
M		4.5			0.177	
M1		4			0.157	
Dia	3.65		3.85	0.144		0.152



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved
HEPTAWATT™ is a Trademark of SGS-THOMSON Microelectronics

SGS-THOMSON Microelectronics GROUP OF COMPANIES
Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands - Singapore -
Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.